

The Aging Factor in Presuppositions Processing

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Introduction: In the psycholinguistic literature, the decline in pragmatic processing with aging in healthy subjects has been studied mainly in relation with two typical pragmatic processes: the turn-taking system (Murphy et al. 2006) and figurative language (Byrd et al. 1991). Apparently, what is still missing is a research line on the effect of age on the processing of presuppositions (PSPs), namely, the information implicitly communicated as taken for granted, which are another core level of pragmatic processing.

Research questions: The present work takes a first step in the direction of a psycholinguistic investigation on the potential impact of the aging factor on the processing of PSPs. In particular, we address three research questions: (i) does the processing of PSPs in online language comprehension involve higher processing costs with healthy older adults as compared to younger speakers? (ii) Does the aging factor affect the ability to recover from the discourse mental model information introduced as presupposed? (iii) Does the aging factor affect the ability of updating the discourse mental model with presupposed information?

Materials: 60 three-sentence stories have been created, with two context sentences and a target sentence. Target sentences contained a definite description (DD) or a change-of-state verb (CSV) presented in condition of satisfaction (SAT) or of accommodation (ACC) – Figure 1. Each story was followed by 3 questions: a *target question* verifying the content of the presupposition activated by the target sentence and two *distractor questions*.

Methods and procedure: In a self-paced reading times paradigm (cf. Tiemann et al. 2011), 21 young adults (mean age: 22.47) and 20 elderly adults (mean age: 63.6) read the stories and answered the 3 true/false questions. *Context sentences* were presented as a whole on the screen. The *target sentences* were presented word-by-word. A *Verbal Working Memory Ability* test was administered too. We collected: (i) participants' word-by-word reading times on the target sentences; (ii) response times to the target questions, and (iii) accuracy (i.e. correct responses to target questions).

Age-related Results: *Word-by-word Reading times* (e.g. sentence region: T1= *give up*, T2+1= *pictures*; see Figure 1) – Figure 2. *T1*: all participants were slower in ACC than in SAT (Condition: $p < 0.05$) and even more with DDs than CSVs ($p < 0.001$). *T2+1*: processing a PSP was costlier for elderly than for younger adults ($p < 0.05$), with elderly participants' higher processing costs for CSVs than for DDs ($p < 0.05$). *Response times* (Figure 3) revealed a significant GroupXConditionXTrigger Type interaction ($p < 0.0001$): recovering an accommodated PSP triggered by DDs elicited longer response times for elderly subjects'. *Accuracy*: no Group effect was observed. *Working Memory*: WM differently accounts for the recovering of information triggered by CSVs in condition of accommodation depending on age group (CondXGroupXTriggerXWM= $p < 0.05$): even for elderly participants with higher WM scores response times were longer ($\beta = 1237.840$; $t = 1.755$) than the younger participants', for whom the higher the WM scores the faster the response times ($\beta = -115.254$; $t = -0.355$).

Discussion: data collected show that aging affects PSPs processing. First, in online language comprehension older adults exhibit higher processing costs with CSVs (*Reading times*), presumably because they involve a demanding temporal mental representation (Domaneschi et al. 2014). Second, since PSPs constitute a condition for the understanding and appropriateness of

an utterance, updating the mental discourse model with presupposed information does not seem to decline across the life span (*Accuracy*). Rather, what seems to decline is the ability to recover from the discourse mental model information introduced in the context as presupposed (*Response times*). Finally, beyond other more explored levels of pragmatic processing, the decline with age of working memory ability seems to affect PSPs processing.

Trigger Type	Condition	Context sentence 1	Context sentence 2	Target sentence
DD	SAT	Enrico and Marta will have dinner in a pub with a pianist tonight.	They have chosen this pub to celebrate their first wedding anniversary.	After the dinner, because of the anniversary, the pianist of the pub will sing a serenade.
	ACC	Enrico and Marta will have dinner in a very suggestive pub tonight.		
CSV	SAT	Paolo really loved taking pictures on the mountains during the weekend.	He has always used his free time to go along with his passions.	Now he works on Sundays, so he has given up taking pictures because it was time-consuming.
	ACC	Paolo has always devoted his weekends to his hobbies.		

Figure 1 Example of an item with DD and CSV in condition SAT and ACC (literal translation from Italian).

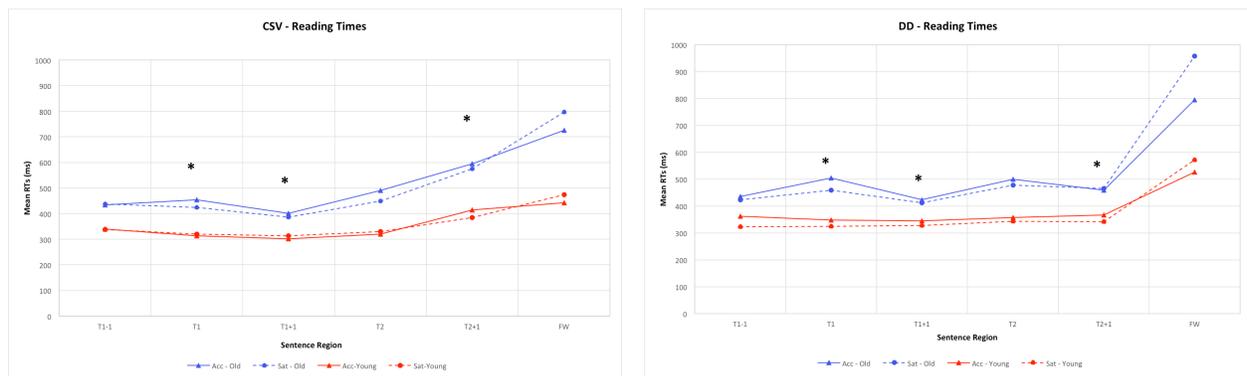


Figure 2. Reading times at different sentence regions for CSVs (2a) and DDs (2b) across conditions and groups.

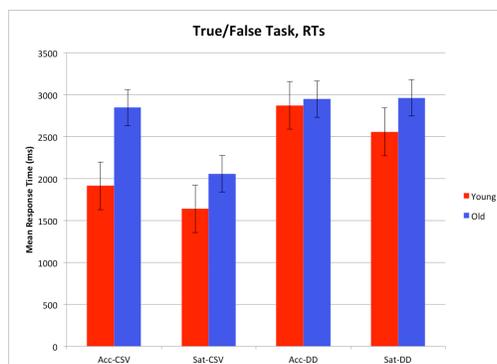


Figure 3 Response times on the true/false for CSVs and DDs across groups in the two experimental conditions

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